



# Lab-Oratory

North Carolina  
N.C. Department of Health and Human Services / State Laboratory of Public Health

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Lab-Oratory, June 2008

Number 91

## From the Director's Chair

While there are always many exciting changes occurring, I wanted to focus on the topic of our new facility, scheduled for completion in late 2010 or early 2011. We continue to make great progress on the designs for the facility that will house the N.C. State Laboratory of Public Health and the Office of the Chief Medical Examiner. As we move forward with this large project in the midst of rising energy costs, however, I thought it might be useful to share some information from the recent annual meeting Association of Public Health Laboratories (APHL) I attended. One of the themes of the meeting was sustainability and "greening" of laboratories, which are, by their nature, energy hogs. Much of this information was provided by Allen Doyle, Department of Ecology, Evolution and Marine Biology at the University of California Santa Barbara.



*Leslie A. Wolf, PhD, HCLD (ABB)  
Laboratory Director*

### GOOS Paper (Good On One Side)

Did you know it takes two to three tons of wood to make one ton of new paper? And that about 1.2 million acres of forest are cleared for paper use in our country? There are many things we can do in addition to recycling paper to minimize the impact of office paper use.

- Re-use envelopes.
- Set margins to 0.75 inches.

Cont. on page 2

## MISSION statement

*The State Laboratory of Public Health provides certain medical and environmental laboratory services (testing, consultation and training) to public and private health provider organizations responsible for the promotion, protection and assurance of the health of North Carolina citizens.*

Director's Chair cont. from page 1

- Join the "No Page Left Blank" movement.
- Double-side print/copy whenever possible.
- Donate paper with one blank side to be re-used in printers.

### Energy Conservation

Did you know that one fume hood uses as much energy as three houses? It is clear by our everyday experiences at work and at home that prices are escalating due to rising fuel and energy costs. There are a number of simple changes we can make to save energy, and some of these suggestions are listed below.

- Create light zones by use of task lamps, by removing bulbs and by turning off lights when not needed.

- Reduce the use of toxic chemicals by using mercury-free thermometers, ethidium bromide alternatives, and "micro" chemistry methods.
- Reduce travel to conferences by use of teleconferencing and by reducing commuting distance when you must travel.
- Reduce the use of plastic, and re-use and recycle plastic as much as possible.
- Recycle paper, aluminum, steel, etc.
- To save water, do not use single-pass cooling and reduce the use of distilled water.
- Before moving, give away and recycle rather than throwing out usable materials.
- When purchasing new equipment, choose Energy Star rated equipment and select the right size appliance for the job. Choose "E-PEAT" certified electronics.
- Keep fume hoods closed when not in use.

For more information, visit <http://sustainability.ucsb.edu/LARS>.

*Dr. Leslie Wolf, Lab Director*

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## State Laboratory Begins Testing for HPV

Human papillomavirus (HPV), the causative agent of genital warts, is the most common sexually transmitted infection, affecting both men and women. According to the American Social Health Association, approximately 5.5 million new cases of sexually transmitted HPV are reported every year. In fact, at least 80 percent of women by the age of 50 will have been infected with genital HPV at some time in their lives.

Persistent HPV infection has been closely linked to cervical cancer in women, particularly infection with certain "high-risk" HPV genotypes including types 16 and 18. Traditional Pap smears and liquid-based cytology (ThinPrep®) look only for abnormal cervical cell changes. The State Laboratory of Public Health (SLPH) Cancer Cytology Unit received approximately 95,000 ThinPrep® samples in 2007, of which 5.7% were reported

as having atypical squamous cells of undetermined origin (ASCUS); 10.1% were diagnosed as low grade squamous intraepithelial lesions (LSIL); 1.5 % had cells consistent with high grade squamous intraepithelial lesions (HSIL); and 0.001% were reported as cervical cancer. ASCUS and LSIL cases have traditionally been followed by colposcopy (cervical biopsy), an invasive, time-consuming and costly procedure. For patients with ASCUS Pap results, the HPV test is useful to identify those patients with an increased risk that the atypical cells will progress to cervical cancer. A negative HPV test result indicates a low likelihood of disease progression, while patients with a positive HPV result should continue to be followed up with colposcopy.

Effective January 2008, SLPH has been performing HPV reflex testing on

samples from women over the age of 20 with ASCUS Pap results, using the Hybrid Capture® 2 High-Risk HPV DNA Test® by Digene Corp. The assay, which detects 13 high-risk HPV types, is not useful for testing in younger women since HPV infection in this age group is common and will usually clear on its own. Results so far show that approximately 60 percent of ASCUS patients test negative for high-risk HPV types, thereby reducing by over half the number of patients who would have previously been referred to colposcopy.

*This article to be seen in EpiNotes.*

*Prepared by Myra Brinson, MT(ASCP),  
Virology/Serology Manager  
and Marjorie Lavender,  
Cancer Cytology Manager,  
NC State Laboratory of Public Health*

## N.C. Public Health, 100 years ago...

### Some Spring Thoughts

“In the spring, after its winter’s sleep, all nature wakes and begins another course of activity and growth. With the song of birds is mingled the song of the mosquito, and in common with all vegetation bacterial life awakens to renewed activity. As a consequence the agencies which produce malarial fevers and the most fatal diseases of infancy are once more to the fore, and it behooves us to take account of them in time, and, so far as possible, counteract and nullify them.

Malarial fevers are among our most common diseases. They are preventable, theoretically entirely, practically largely. Prevention consists simply in destroying

the only known means of transmission—the mosquito. No anopheles mosquitoes no malaria, is now regarded as an established fact. Comparatively only a few mosquitoes through the winter live, and the time to wage war upon them is while their army is small and weak. The method of warfare to be pursued—and the only successful method—is to remove the conditions upon which they are absolutely dependent for multiplication, to-wit, all stagnant water within a reasonable distance to the dwelling. While the draining of swamps and large ponds may not be feasible, it should be borne in mind that comparatively few of our people live in close proximity to these, and the mosquitoes do not fly far from their

breeding places. The trouble lies chiefly in the rain barrel, tin cans, etc., lying about the premises, and in the little pools to be found in ditches near the house. The former can easily be done away with entirely, and the latter, if undrainable, should be covered with a little oil not less frequently than every fortnight. By looking after these matters as soon as warm weather begins, and continuing it during the summer, much sickness, and more annoyance, would be avoided.”

*Bulletin of the  
North Carolina Board of Health  
Vol. XXII, No. 12.  
March, 1908*

## Helping People One Test at a Time: National Medical Laboratory Professionals Week

National Medical Laboratory Week, April 20-26, was a time to recognize the 214 lab professionals who have chosen careers at the North Carolina State Laboratory of Public Health (NCSLPH). The state laboratory screens and performs tests in areas such as cancer cytology, virology and serology, newborn, microbiology, clinical chemistry, and environmental sciences. The 2007 fiscal year accounted for 2,321,907 tests being performed at the NCSLPH.

Each positive or abnormal test that is reported enables people to be helped.

Cancer Cytology diagnosed 19,706 specimens as atypical, ranging from atypical squamous cells of unknown significance (ASCUS), to dysplasia, to cancer. This correlates to a 21 percent abnormal rate for our population. Syphilis Serology reported 88,220 Trust screening tests for syphilis, of which 1,212 were positive (1.4%). Another 93,694 tests were performed for chlamydia, with 7,168 (7.6%) positive. And 93,694 tests for gonorrhea were performed, with 1,985 (2.1%) positive.

With all these tests, it is no wonder that it was time to take time out of busy schedules to show support to all the lab professionals at the NCSLPH.

The week was thoroughly enjoyed – there was bonding time amongst lab personnel while also working towards sharing information about each other’s departments through departmental banners.

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# SECTION SHOWCASE

## Laboratory Improvement

Laboratory Improvement, based in the State Laboratory of Public Health in downtown Raleigh, is the training and consultative unit for the state of North Carolina. Since the early 1970s, the Laboratory Improvement Unit has been the largest public health training group in the United States.

The roles within the office are diverse. The Raleigh office consists of the coordinator, office assistant, medical technologist, laboratory manager, and three consultants. This group is responsible for varying duties, including conducting teleconferences offered by such agencies as American Society for Clinical Pathology and Clinical Laboratory Standards Institute; planning and conduct-

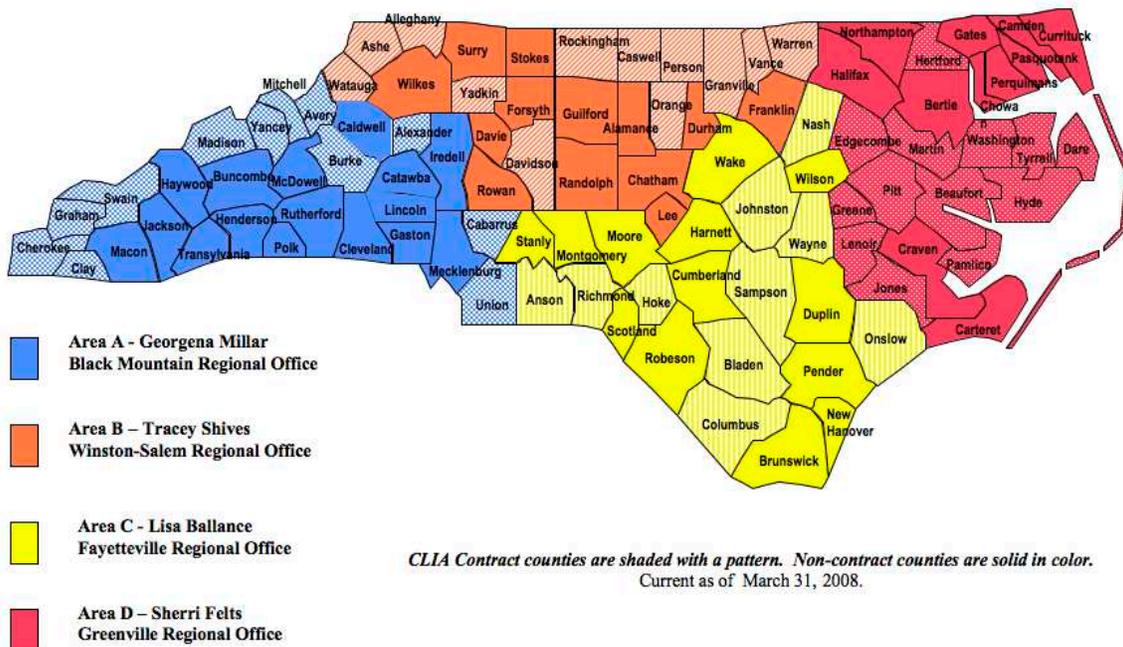
ing training via the state's Public Health Information and Training Network (PHITN); planning and preparing training events and workshops for personnel working in public health, physician's office and hospital laboratories; maintaining and distributing stock cultures for use in clinical and environmental laboratories; quality control of selective media used in the state's local health departments; maintaining and distributing audiovisual resources for continuing education; assisting in the administration of the competency assessment program; conducting safety evaluations of local health departments and state laboratory labs; and the list goes on.

In addition to the Raleigh staff, North Carolina's Laboratory Improvement office is unique in that it employs four regional consultants, based in Black Mountain, Winston-Salem, Fayetteville, and Greenville. These consultants serve in the Clinical Laboratory Improvement Amendments (CLIA) mandated positions of technical consultant to the 48 laboratories participating in the NCSLPH Contract Program. They provide technical assistance at the local level in all areas of laboratory management, including technical procedures, administrative policies, quality assurance, verification of educational requirements of testing personnel, and accreditation. They also serve as liaisons between various local, regional and state entities.

Cont. on page 5

### North Carolina State Laboratory of Public Health

#### Regional Consultants' Areas of Service 2008



Section Showcase cont. from page 4

Laboratory Improvement’s goal is to support North Carolina laboratorians in achieving and maintaining high standards of lab practice through effective consultation and the delivery of comprehensive and relevant training, while striving to serve as a model for other training units.

To attain this goal, the following objectives were established:

- Provide consultation and leadership to laboratories, state agencies, and other states.
- Ensure regulatory compliance and provide technical services for CLIA contract counties.
- Develop and make available continuing education opportunities and resources.
- Serve as an advocate for laboratorians.
- Maintain and distribute microbiological cultures.
- Perform quality control on GC-lect media.

In order to accomplish their goals, the Laboratory Improvement staff has developed cutting-edge programs never seen before. Among these has been an exciting new Phlebotomy Initiative, in which health department laboratories were led to evaluate their programs primarily in the areas of training and competency. The state’s first annual North Carolina Clinical Laboratory Tech Day, held in August 2005, featured renowned author and educator and legal consultant, Dennis Ernst. Attendees included over 200 laboratory personnel, phlebotomists, and nurses. Subsequent events have been equally well received, featuring experts in the field of diabetes and sexually transmitted diseases. This year’s conference, entitled “Ride the Waive of Laboratory Testing,” promises to be an equal success.

The NCSLPH newsletter, Lab-Oratory, resurrected in March 2006, is distributed state- and nation-wide, and has received great reviews, even from labs across the country. SCOPE, the State Lab’s guide to services, was completely updated and is now featured on the NCSLPH website. An online tutorial featuring the proper completion of Newborn Screening Form DHHS 3105 was added to the State Lab website in November 2006. This course was designed to improve the unsatisfactory rate of forms submitted for testing. To date, 1,632 people have completed the training course.

In 2007, the following educational events were provided by Laboratory Improvement:

Type of event	Number of events	Number of Students	Student Class Hours	Contact Hours Awarded
Workshops	76	3097	433.5	10272.75
Teleconferences	31	381	386	386
Lending Library		110		
<b>Totals</b>	<b>107</b>	<b>3588</b>	<b>819.5</b>	<b>10658.75</b>

In addition, the office is currently evaluating new types of training opportunities, including more online courses and off-site workshops. Suggestions for training ideas are welcomed and strongly considered. Please send your ideas to the Laboratory Improvement office, attention: Kristy Osterhout, Laboratory Improvement Coordinator, at [kristy.osterhout@ncmail.net](mailto:kristy.osterhout@ncmail.net). Or call us at (919) 733-7186.

*Submitted by:  
Crystal Poppler, BSCLS (ASCP)  
at the North Carolina State Laboratory  
of Public Health*

## GC Media in the Summertime

As you may have noticed, it is now summertime in North Carolina. The heat and humidity bring out the worst in your GC Media. Please be especially vigilant about placing the media in the refrigerator as soon as you receive your shipment. In addition, carefully inspect your plates for signs of heat damage and deterioration. Look for the following signs:

- Melted agar
- Media that has fallen out of the plates
- Contamination (the antimicrobial agents tend to break down in the heat)

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Helping People cont. from page 3

Throughout the week we also had several “Getting To Know You Games” like crossword puzzles and “the eyes have it” (we had to see how well we knew our coworkers using pictures of just their eyes).

Each day of the week had a theme and an activity planned – Monday was Cancer Awareness Day; we wore colors associated with various cancers that we were personally impacted by, made cancer awareness pins and kicked off the week with a pot luck lunch. Tuesday we wore our favorite professional sports team colors and enjoyed lunch and a movie. Wednesday was “wear your favorite button day,” and the Laboratory Management Team provided a fantastic breakfast for the lab.

Thursday was “wear your favorite college team colors”—needless to say we had some NC State vs UNC battles. Friday was a “let down your hair” day or cover it up, and “wear your favorite hat day”—we had a room set up where lab personnel could relax during breaks and lunch and play their favorite game (Darts, Uno, spades, Boggle and even virtual table tennis).

This year’s Laboratory Professionals week was deemed a success. Thank you to ALL lab professionals. You all make a difference, “Helping People One Test at a Time”!



# BE on the LOOKOUT

**2007 End of Year LabOratory quiz will be available online soon! Go to the following URL to access the quiz.**

[www.quia.com/quiz/1416325.html](http://www.quia.com/quiz/1416325.html)

**This year’s quiz will be worth 1.5 contact hours of continuing education credit. Upon successful completion, email Crystal Poppler at [crystal.poppler@ncmail.net](mailto:crystal.poppler@ncmail.net) with your score and facility information in order to receive your CEU certificate.**

# Microscopy Notes

Using a microscope requires knowledge about one of the oldest laboratory inventions, as well as skill and experience. Whether you are a new user or just confused about something, the Laboratory Improvement Unit at the N.C. State Laboratory of Public Health is here to assist. Send your microscope questions to [colleen.miller@ncmail.net](mailto:colleen.miller@ncmail.net). Getting to know your microscope better will improve overall performance of the operator and the instrument.

The following are examples of questions that are frequently asked about optical microscopes:

**Objectives are usually inscribed with a colored ring. What is the significance of the colors?** The rings make it easier to visually identify the magnification of the objective. The following colors are standard for the objectives of most manufacturers: yellow for 10x, blue for 40x and 50x, and white for 100x.

**What does the inscription 160 mean on an objective?** This number identifies a finite (fixed) tube length objective that is used with a mechanical tube having a fixed length; i.e., 160 millimeters from the opening of the nosepiece (where the objective is screwed in) to the top of the observation tube (where the eyepiece is inserted). If this distance is lengthened by inserting an accessory (such as a camera) into the light path above the nosepiece, the image will be degraded unless corrected lenses are included with the accessory.

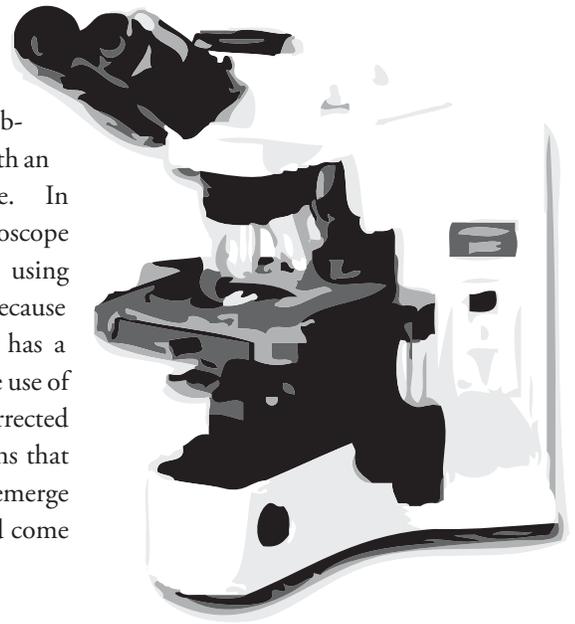
**What is the significance of the objective inscription  $\infty$ ?** This symbol identifies the

objective as an infinity-corrected objective that is designed to be used with an infinity-corrected mechanical tube. In the past 10 years, most major microscope manufacturers have migrated to using infinity-corrected optical systems because the fixed mechanical tube, which has a length of 160 millimeters, limits the use of optical accessories. The infinity-corrected mechanical tube has an internal lens that causes parallel light rays, which emerge from the objective, to converge and come into focus.

**Can an infinity-corrected objective be used on microscope with a finite tube length?** No, because there is not a tube lens that will bring parallel rays to focus in the finite microscope system.

**Can a finite tube length objective be used on an infinity-corrected microscope system?** No, because the presence of the tube lens in the light path will result in a deteriorated image.

**What is meant by the numerical inscription 0.25 on the barrel of the 10x objective, 0.65 on the 40x objective and 1.25 on the 100x objective?** These numbers express the light gathering ability, or numerical aperture (N.A.), of a microscope objective. N.A. is a measure of the number of highly diffracted image-forming light rays captured by the objective. Higher values of N.A. allow more light rays to enter the objective front lens, producing a more highly resolved image; i.e., the objective is better able to separate the details of the specimen in forming an image. Also, the higher the N.A., the brighter the image. Higher N.A. objectives are usually more expensive.



**What is the significance of the inscription 0.17 on the objective?** The numerical inscription, 0.17, refers to the thickness, in millimeters, of the cover glass. A cover glass becomes a part of the optical system and its thickness is critical for optimal performance of the objective. Deviating from the thickness inscribed on the objective (or no cover glass at all) may result in deterioration of the image when using an objective with a numerical aperture higher than 0.45.

Send your question(s) by email and get to know this amazing instrument better. Let us explore the endless and fascinating world accessible through the microscope lens.

*Submitted by*

*Submitted by Colleen Miller, BS MT(ASCP)  
Laboratory Improvement Consultant*

# EDITORIAL

## Needle Points

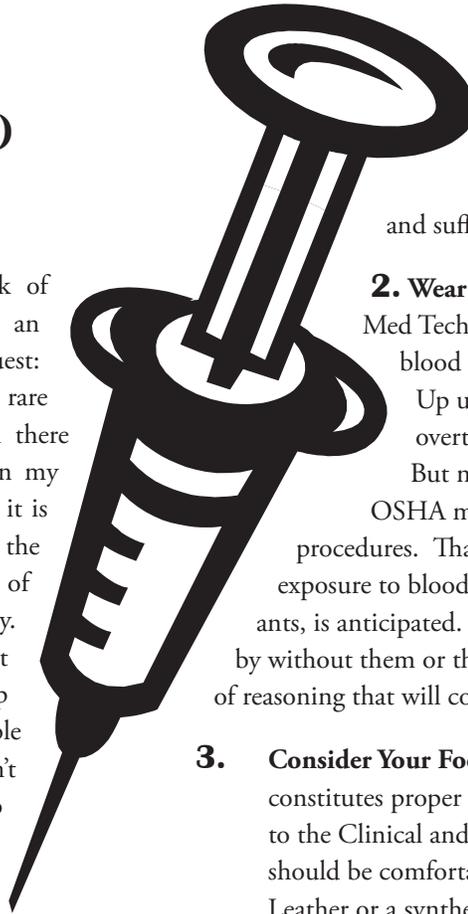
By Lisa O. Ballance,  
BSMT (ASCP), CLC (AMT)

### Lessons from a Fire Ant

Over the last several years, my neck of North Carolina has experienced an invasion by a most unwelcome guest: the fire ant. What started out as a rare encounter with an ant hill here and there has now exploded into all-out war on my property. But despite my best efforts, it is a battle I am losing, as evidenced by the continued acquisition and occupation of new territory by this six-legged army. Any place you step in my yard could put you behind enemy lines. Heaven help you if you are barefooted and stumble across one of their bunkers. It wasn't always war, but the ants took it too far when a local elementary school had to discontinue their annual Easter egg hunt. With ant mounds cloaked by the school's grassy lawns, authorities said it was a matter of risk management. One misstep and a child could detonate one of nature's fiercest living land mines. Even our community has symbolically embraced the inevitability of the fire ant's presence with the renaming of our local hockey team, the Fayetteville Force, to the Fayetteville Fire Ants. And guess what? The Fire Ants are winning.

So in this struggle of property owner versus insect, is there any good that can come from it? Are there any lessons we can learn from the fire ant? You bet.

**1. Remain Vigilant.** Those who perform blood collection procedures must remain on constant alert for complications or adverse reactions in their patients. As long as a patient is under your care, he/



she should be within your sight and remain the center of your attention. Allowing yourself to become distracted around your patients, or a fire ant mound, will eventually end the same way: with costly mistakes, needless injury, pain and suffering.

- 2. Wear Gloves.** Back in the '80s when I completed my Med Tech internship, gloves weren't required. We drew blood barehanded and never thought a thing about it. Up until a few years ago, I could pull weeds and overturn rocks lining my flower beds the same way. But no more. In its Bloodborne Pathogens Standard, OSHA mandates glove use during all vascular access procedures. That includes phlebotomy. Gloves are a must when exposure to blood, other potentially infectious material, and fire ants, is anticipated. Don't fool yourself into thinking you can get by without them or that you can selectively use them. It's a line of reasoning that will come back to bite you.
- 3. Consider Your Footwear.** There's much debate as to what constitutes proper footwear in a laboratory setting. According to the Clinical and Laboratory Standards Institute (CLSI), footwear should be comfortable, rubber-soled, and cover the entire foot. Leather or a synthetic, fluid-impermeable material is suggested. Trust me; clog-style shoes that have holes across their surface won't protect your feet from spilled substances or a swarm of angry fire ants.
- 4. Respect What Can Hurt You.** In phlebotomy procedures, what can hurt you is a contaminated sharp. It took several painful encounters with fire ants for me to realize there are serious consequences to not respecting the danger they pose. Don't let it take a needlestick to make a believer out of you. Fire ant bites can blister and scar. Bloodborne pathogens can kill. Always use safety sharps devices and immediately activate the safety feature according to manufacturer's directions, without fail.
- 5. Forget Homespun Techniques.** I've been known to try a home remedy or two in my attempts to exterminate our invaders. Someone told me to sprinkle uncooked grits around the mounds. The theory being the ants would eat the grits; the ground grain would swell in their digestive tracts and cause them to explode. It sounded like a good plan to me. Problem is, it didn't work. If anything, it made my ants heartier. The only effect I've seen from the grits is the ants now ask with a Southern drawl "Can we have red-eye gravy and biscuits with that?" The lesson? Homespun methods can have unintended outcomes. Injure a patient

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Needle Points cont. from page 8

while operating outside the standard of care for phlebotomy and you've just made a lawyer heartier and your career extinct.

**6. Work as a Team.** Part of what makes the lowly fire ant such a formidable foe is its ability to rally the troops on a moment's notice. While under attack, never have I heard one fire ant say, "That's not my job", or "I'm on break, the work will have to wait." Quite the contrary, these social creatures consistently respond in unison 24/7. When everyone in the workplace is organized, pulls together and gives the task at hand their all, it's amazing what can be accomplished.

**7. Be the Best.** I don't know what kind of underground training is occurring beyond my doorstep, but you can bet it's rigorous, accurate, thorough, and ongoing. I know this because my ants are not just regular run-of-the-mill ants. They are a breed apart; Special Forces/Delta Force caliber. To set yourself apart as a phlebotomist extraordinaire, it requires training that is rooted in the standards, compliance with OSHA regulations and plenty of supervised practice. Professional certification is icing on the cake. When nurtured in a climate committed to quality, patient safety and ongoing continuing education, you can't help but flourish, just like my ants.

Yes, the Fire Ants are winning. But I guess that's not such a bad thing. After all, you can learn a lot from a fire ant.

# QA Tips

**Here's a handy review of your Quality Assessment tips from January to May 2008. We'll be bringing you more in the September edition of LabOratory!**

## January 2008 – QA Tip

**January was the time to review your QA calendar and make sure that you have scheduled time during 2008 to review and update your policies and procedures.**

Have employees been made aware of any changes and they sign off on the policies/procedures?

## February 2008 – QA Tip

**MSDS – Do you have copies of the MSDS sheet for the chemicals in your lab?** Have you reviewed the MSDS to make sure it is current and hasn't been updated, especially if you have changed vendors? Does your procedure include how to dispose of chemicals used in your lab? Safety is an important aspect of QA and safety is everyone's concern.

## QA Tip – March 2008

**Personnel – There are several QA activities performed for personnel**

1. Is it time to review job descriptions to keep them current?
2. If you have new staff, have they completed orientation/training and is it documented? Do you have copies of their education and training?
3. Don't forget competency assessment for staff!
4. Are they recording their contact hours for trainings?

## April/May 2008 – QA Tip

**Have you reviewed the QA studies that you submitted?**

Once or twice a year, it is a good idea to review your QA studies to see if the corrective action fixed the problem or if you had more than one QA study for the same issue. If the corrective action didn't address the problem, it's time to reanalyze the root cause and try another solution.

# Urinalysis Study Goes On-line

The *Urine Microscopic Examination Study* will soon be virtual. For years, the study was only available in a hard-copy format that could be borrowed from the Audio-Visual Library at the North Carolina State Laboratory of Public Health. The course has been revised into an interactive program that will soon be accessible on the State Lab website.

The study was designed to improve the skills of clinical laboratorians performing a test that is an important, frontline laboratory procedure. Although urinalysis is the oldest of all medical laboratory tests, it is often poorly performed. The accuracy of the test may be compromised by a lack of education and training, as well as poorly controlled laboratory methods. This study should be used as a review, or to enhance formal training in microscopic urinalysis. Beginning in 2009, the study will be a prerequisite for all participants who register for the Basic Urinalysis Workshop.

The on-line study will open to a series of slides that can be advanced at the user's pace. It begins by describing the procedure for examining urine sediments using a standardized method. The use of standardized slide systems and microscopic enhancements, such as a urine sediment stain or phase-contrast

microscopy, improve the reliability and sensitivity of the test. Numerous images are used in the study to identify normal and abnormal elements that are observed in urine, as well as artifacts that may be encountered. The study also instructs users in the techniques for reporting microscopic findings. The final slide provides the user an opportunity to take a short quiz which is required for continuing education credits. Upon successfully completing the study and quiz, the user will receive a certificate for 2.5 P.A.C.E. contact hours. The time it takes to complete the study is dependent on the user's skill in the examination of urine sediments.

Overlooking microscopic findings on a urine sediment examination could adversely impact the health of a patient. The microscopic examination of the urinary sediment can aid the clinician in diagnosing diseases such as urinary tract infections and occult glomerulonephritis in many asymptomatic patients. Accurate and reliable testing has become increasingly important, as the incidence of renal and urinary tract diseases are on the rise. The National Kidney Foundation estimates that 26 million Americans suffer from chronic renal disease ([www.kidney.org/kidneydisease](http://www.kidney.org/kidneydisease)).

If detected and treated early, the severity of chronic renal disease may be reduced. Unfortunately, disease progression may eventually lead to kidney failure, which requires dialysis or a kidney transplant to maintain life.

This study is one of many resources that are available to assist clinical laboratory professionals as they strive to enhance their microscopic skills and clinical correlative ability. The book *Wet Urinalysis, Interpretations, Correlations and Implications* by Schumann and Friedman is a comprehensive reference available through American Society for Clinical Pathology (ASCP) Press. An old favorite by Sister Laurine Graff, *A Handbook of Routine Urinalysis*, is still available from Amazon.com. Video programs that may be borrowed from the Audio-Visual Library at the State Lab include the following: *Bayer Encyclopedia of Urinalysis* (2 hours on CD) and *Urinalysis – The Inside Story of Collection and Evaluation* (47 minutes on CD).

This study should be available on-line by July 14th at <http://slph.state.nc.us>. Send your questions to [colleen.miller@ncmail.net](mailto:colleen.miller@ncmail.net) or call (919)807-8578.

Submitted by  
Colleen Miller, BS MT(ASCP)  
Laboratory Improvement Consultant

# Proper Disposal of Smoke Detectors

Roger P. Brown, Supervisor/RSO

Radiochemistry Laboratory, Environmental Sciences Unit

When it comes time to dispose of the ionization-type detectors sold commercially, keep this in mind:

Current ionization-type smoke alarms utilize a small amount of the **radioactive material Americium-241** (Am-241). This isotope has a half-life of 432 years, but the total amount of radioactive material

contained inside is usually less than 1.0 microcuries ( $< 1.0 \mu\text{Curies}$ ), which is a very small amount. Residential ionization-type smoke detectors purchased at hardware and home-improvement stores (Home Depot, Lowe's, etc.) are **exempt** from any special disposal regulations (NRC, EPA, state, et al) and can generally be thrown away in everyday trash.

As an alternative, if you want to dispose of these things even more carefully, many manufacturers will accept old detectors by mail and will either recycle the material or dispose of the detector themselves. See the accompanying articles, *Smoke Detector Disposal Information*, *Disposal of Smoke Detectors*, and *Americium 241*.



## Disposal of Smoke Detectors

The most common types of smoke detectors, ionization detectors, contain less than one microcurie of Americium 241, a radioactive material. Americium can pose a health hazard if the smoke detector is broken open. For this reason, these smoke detectors must, by law, be labeled for radioactive content. Because the risk to consumers and solid waste workers is insignificant, the Nuclear Regulatory Commission allows household smoke detectors to be disposed of in household trash. When the smoke detector needs to be replaced, wrap it in newspaper and place it in a cardboard box for disposal.

Some manufacturers accept returned ionization smoke detectors and recycle the Americium. If local regulations prohibit disposal of smoke detectors in household trash, return them to the manufacturer. **Send smoke detectors by surface mail and print the words For Disposal Only \$0 Value on the front of the package.** Recycling centers and businesses must call before shipping more than three units; consumers do not need to call.

### First Alert, BRK, and Family Guard Smoke Detectors only—

Send to: First Alert BRK Brands, Inc., 3901 Liberty Street Road, Aurora, IL 60504-8122, 1-800-323-9005. [www.brkelectronics.com](http://www.brkelectronics.com)

### American Sensors and Dicon Smoke Detectors only—

Send to Dicon Global, Inc., 20 Steelcase Road West Unit #3, Markham, Ontario L3R 1B2, Canada, 1-800-387-4219. [www.diconglobal.com](http://www.diconglobal.com)

Smoke detectors have a life span of about ten years, after which they should be replaced. To make sure your smoke detectors will work when needed, test them with actual smoke. Clean battery-operated models once each year with a hair dryer on cool setting or with compressed air. Electric models do not open easily for cleaning.



Barnstable County  
**HAZARDOUS MATERIALS PROGRAM**  
Collaborating with the University of Massachusetts Cooperative Extension  
800-319-2783 508-375-6699 12/06

## Americium 241

Ionizing smoke detectors contain Americium 241, a radioactive material. There are three types of radioactive isotopes: alpha, beta and gamma

emitters. Beta emitters give off an electron, which is several orders of magnitude smaller than the alpha emitter's hydrogen nucleus, and thus faster and more potent. Gamma emitters give off non-particulate rays that can penetrate most anything but lead, and are the most damaging.

The isotope in smoke detectors is an alpha emitter, which is a large particle (a hydrogen nucleus) of low energy that cannot travel through any physical barrier and moves very slowly. Thus it cannot usually be detected in a load of trash, and is relatively harmless. One or two smoke detectors in a load of trash are not usually detected, but a large number of smoke detectors in a single load is likely to be detected.

Cont. on page 12

## Smoke Detector Disposal Information

**T**he most common type of smoke detector used in residential homes contains a minute amount of radioactive material\*. Although the amount of radioactive material contained in these detectors is so small that it does not pose a risk to human health, some localities, including Santa Barbara, do not allow them to be disposed of with municipal waste. In this case, smoke detectors that contain radioactive material can be returned to the manufacturer for disposal. When returning a smoke detector to the manufacturer, include a note that indicates that the detector is intended for disposal and mail it to the address listed on the back of the detector.

**The following manufacturers/distributors of smoke detectors will take back smoke detectors that they manufacture:**

MANUFACTURER/ DISTRIBUTOR	PHONE NUMBER	ADDRESS FOR RETURN	NOTES
<b>AMERICAN SENSORS/ DICON</b>	(800) 387 4219	Call to receive a reference number and return information	Accepts "Dicon" and "American Sensors" brands only.
<b>FIRST ALERT/ BRK</b>	(800) 323-9005 ext. 2	Customer Service Department 3920 Enterprise Court Aurora, IL 60504	Accepts up to four detectors at a time. Please call ahead for mailing instructions.
<b>G.E. SECURITY/ ESL</b>	(888) 437-3287	12345 Southwest Levetan Drive Tualatin, OR 97062	Will accept "ESL" brand only.
<b>HONEYWELL</b>	(800) 328-5111	Returned Goods, Honeywell Inc. Dock 4-MN10-3860 1985 Douglas Drive North Golden Valley, MN 55422	cstrcare@honeywell.com
<b>INVENSYS/ FIREX</b>	(800) 445-8299	Invesys Controls c/o Firex 28 C Leigh Fisher Boulevard El Paso, TX 79906	E-mail address: technicalservice@invensys.com Website address: www.icca.invensys.com
<b>SEARS</b>	local number	Some Sears locations are designated collection sites	Call to find out if your local Sears will accept smoke detectors.
<b>SYSTEM SENSORS</b>	(800) 736-7672 ext. 1	Call to receive a reference number and return information	Will accept "System Sensor" brand only. Please include a payment of \$3.00 for each smoke detector mailed to cover the firm's recycling costs.
<b>USI ELECTRIC/ UNIVERSAL</b>	(800) 390-4321 ext. 1	7A Gwynns Mill Court Owings Mills, MD 21117	Return only detectors that say "ionization" on the back. Only USI Electric or Universal brand smoke detectors accepted.

*\*Ionization type smoke detectors contain Americium 241.  
Photoelectric type detectors do not contain radioactive material.*



# The Safety Corner

## What's *Right* with This Picture?

### “Signs, Signs, Everywhere There’s Signs!”



Hazard communication is a key element in all laboratories. It is of utmost importance to post signs to warn employees and clients of potential dangers. Signage may also aid in case of an emergency.

Many different types of signage are mentioned in OSHA regulations. In conducting various inspections, certain signs were found to be overlooked by laboratory staff. Among those are:

- Biohazard symbols
- Must be posted on all entrances.
- Should be posted on any potentially contaminated equipment, such as incubators, refrigerators and centrifuges.
- Eyewash/Safety Shower
- Should be easily visible for all areas of the laboratory.
- Emergency telephone numbers
- Must be posted by all telephones.

- At a minimum, include 911 or 9-911, depending on your facility's phone system.
- Other good numbers to include are poison control, your facility's safety officer, and the local police department.
- OSHA Posters
- At a minimum, all covered employers are required to display and keep displayed, a poster prepared by the Department of Labor informing employees of the protections of the Occupational Safety and Health Act.
- OSHA also has other informative posters on their website, *OSHA.gov*.
- Chemical storage
- All chemicals should be clearly identified so employees know the hazards in the laboratory.
- Flammables cabinets should be marked clearly in case of a fire emergency.

Signs are an excellent communication tool in all areas of the laboratory. These are just a few examples of signs that should be posted. Know your hazards and know how to identify them for those with less knowledge in the laboratory. If you have any questions regarding this or any other safety issues, please contact Kristy Breedlove at [kristy.breedlove@ncmail.net](mailto:kristy.breedlove@ncmail.net) or (919) 733-7186. Look for the next installment of The Safety Corner when we will continue with the series, “What’s Right With This Picture”!

*Submitted by:*

*Kristy Breedlove, BS,*

*Laboratory Improvement Consultant,  
NCSLPH*

GC Media cont. from page 5

LabsCo does include icepacks in your shipments. However, these tend to melt by the time that the shipments reach some of the farthest counties. It is unavoidable that some of these plates may be slightly warm upon arrival. If you see any signs of visible damage, do not hesitate to contact the HIV/STD office at (919)733-2030 and speak to either Rick or Laura to get replacement plates. If they are just warm but not visibly damaged, be sure to do your sterility testing and monitor contamination as you use these plates. Please let me know if you have any questions or concerns. I can be reached at (919)733-7186 or [jennifer.a.anderson@ncmail.net](mailto:jennifer.a.anderson@ncmail.net).

2008 WORKSHOP SCHEDULE FOR JULY-SEPTEMBER

# SUMMER

N.C. Department of Health and Human Services  
 State Laboratory of Public Health  
**Laboratory Improvement (LI)**

DATE	TITLE	APPLICATION DEADLINE DATE
July 15-18	Bacteriological Methods in the Analysis of Drinking Water	June 18
July 16	Packaging & Shipment of Biological Specimens from Possible Chemical Agent Exposures to the NCSLPH	June 16
July 30 & 31	Laboratory Methods in the Diagnosis of Gonorrhea	June 30
August 12-15	Process Control Chemistry	July 15
August 21	Bioterrorism Preparedness for Clinical Laboratories	July 21
September 11	Syphilis Serology	August 11
September 12	State Lab Orientation	August 12
September 19	Writing Laboratory Procedures	August 19

*Disclaimer: These workshops are not intended to replace formal education but to enhance skills and promote use of recommended standard techniques.*

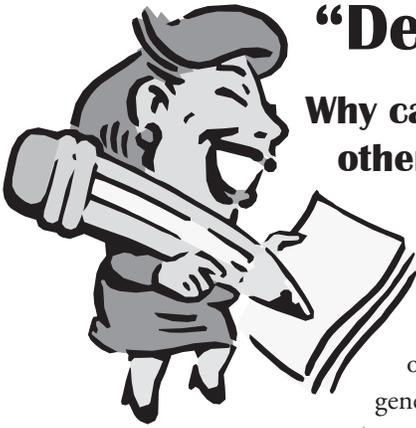
For more information, consult your LI 2008 WORKSHOP ANNOUNCEMENTS or contact LI at 919-733-7186.

<http://slph.state.nc.us>



State of North Carolina | Department of Health and Human Services  
 Division of Public Health | State Laboratory of Public Health  
[www.ncdhhs.gov](http://www.ncdhhs.gov)

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 05/08



## “Dear Lab-bey”

### Why can some people smell a positive “whiff” test while others cannot?

The whiff or amine test is performed as part of the procedure for reading a wet prep specimen for vaginosis. When KOH (potassium hydroxide) is added to a vaginal specimen, a fishy odor is often noted in cases where clue cells or trichomonas are present. The reason for this is that certain volatile amines are generated by metabolism of bacteria found in BV (bacterial vaginosis). These amines (putrescine and cadaverine) are breakdown products of amino acids generated by the metabolism of the abundant bacteria found in BV and are responsible for the characteristic “fishy” odor. The KOH solution intensifies this odor. If a person has difficulty detecting the odor, the first step in troubleshooting is to determine if the correct procedures are being followed for the whiff test:

1. The wet-mount specimen must be evaluated immediately upon arrival in the laboratory.
2. Vortex-tube or vigorously mix the swab in and out of the saline, making sure to collect any material that may be adhering to the side of the tube.
3. Remove the swab from the saline, expressing excess solution into the tube.
4. Use a pipette to aspirate the well-mixed saline suspension.
5. Dispense one drop of the suspension onto a labeled slide.
6. Add one drop of 10% KOH to the drop.
7. Sniff the slide immediately, using your hand to waft any odor towards your nose. Assessment of a fishy odor indicates an amine positive reaction and thus the probable presence of clue cells and/or trichomonads in the specimen.

If the procedure is being performed correctly, there are several reasons that may account for disagreement in results between observers.

- Test-related factors:
  - use of KOH bottles of differing potency
  - any delay in performance of the test
  - use of insufficient quantity of discharge
  - interference with the test by use of absorbent material (such as a cotton swab)
- Observation dependent factors:
  - degree of skill in performing the test
  - ability to smell
  - degree of ventilation and distance from the sample during the test

Possible solutions for this problem could involve confirming results with another tech or supervisor, retraining, or relying on other diagnostic tools to identify BV.

#### References:

Cohrssen A, Anderson M, Merrill A, and McKee D. Reliability of the Whiff Test in Clinical Practice. *Journal of the American Board of Family Practice*. 2005; 18(6): 561-562.

Laboratory Improvement. Diagnosing Vaginitis Using the Wet Mount Exam (Workshop.) Raleigh: North Carolina State Laboratory of Public Health. Updated November 2007.

Seattle STD/HIV Prevention Training Center. Examination of Vaginal Wet Preps (Video.) National Network of STD/HIV Prevention Training Centers. 2001. Available at [http://depts.washington.edu/nnptc/online\\_training/wet\\_preps\\_video.html](http://depts.washington.edu/nnptc/online_training/wet_preps_video.html). Accessed November 21, 2007.

# Precautions When Using Fluorescent Light Bulbs

While fluorescent light bulbs are energy efficient and extremely popular right now, please keep the following in mind: Broken compact fluorescent light bulbs (CFLs) release mercury vapors, and require special handling to clean up.



The EPA (Environmental Protection Agency) warns against vacuuming and using a broom to sweep up the pieces. Instead, they suggest that you first vacate the room, avoiding the area where the

broken bulb is, Turn off central heat or air conditioning to avoid spreading the mercury vapor to other areas, and open the windows for at least 15 minutes to allow any mercury vapor to dissipate. Then, clean up the breakage while wearing protective gloves, and put all the broken pieces in double plastic bags for disposal. They also suggest using sticky-side-out duct tape to pick up small pieces. Wipe the area clean with damp paper towels or disposable wet wipes. Place the towels and the tape in the plastic bag and seal. Immediately place all bagged clean-up materials outdoors in a trash container for the next normal trash pickup. Wash your hands thoroughly afterward.

For more detailed information, see the EPA website at [www.epa.gov/mercury/spills/#fluorescent](http://www.epa.gov/mercury/spills/#fluorescent).

## “Dear Lab-bey...”

**If you have a technical laboratory question that you would like to have answered please submit it to: [Jennifer.A.Anderson@ncmail.net](mailto:Jennifer.A.Anderson@ncmail.net). The answer to your question may be featured in the next edition of Lab-Oratory.**

## EDITORIAL board

**Holly Lee**, Bioterrorism and Emerging Pathogens; **Patty Atwood**, NBS/CC;  
**Susie Lavender**, Cytology; **Brenda Webber**, Cytology; **Jennifer Anderson**, Lab Improvement;  
**Kristy Breedlove**, Lab Improvement; **Colleen Miller**, Lab Improvement;  
**Crystal Poppler**, Lab Improvement; **Janice West**, Lab Improvement; **Vanessa Campbell**, Virology/ Serology

**North Carolina State Laboratory of Public Health (NCSLPH)  
Packaging & shipping instructions for blood lead**

<u>Shipping Method</u>	<u>Regulatory Agency</u>	<u>Classification</u>
US Postal Service	IATA	Exempt Human

**Maximum volume allowed:** 50 ml per NCSLPH shipping container

**Supplies needed:**

NCSLPH Blood Lead/Prenatal shipping container with green NCSLPH shipping label  
Securely sealed and labeled primary container (microtainer)  
Cushioning and absorbent material\*  
Leak-proof secondary container (zip-type baggie) with attached biohazard label\*  
Completed requisition form for each specimen (Printed from our website)

**Packaging Instructions:**

1. Place the microtainer or venous tube with unique identifiers in a leak-proof zip type baggie marked with a biohazard symbol.
2. Place enough absorbent material (to soak up all of the liquid) inside the zip type baggie. (paper towels, tissues, etc.)
3. Place the zip type baggie into the outer shipping box (with green label).
4. Place enough cushioning material to hold the zip type baggie securely during transit.
5. Place requisition forms inside the shipping box. (But NOT inside the zip type baggie with specimens)
6. Seal the shipping box. (Make sure the green NCSLPH shipping label is attached).
7. Place your return address label on outside of shipping box.

If you have any questions about packaging specimens for transport, please contact Kristy Osterhout at 919-733-7186 or [kristy.osterhout@ncmail.net](mailto:kristy.osterhout@ncmail.net).

If you have any questions about Blood Lead testing at the NCSLPH please call Newborn Screening/Clinical Chemistry Office at 919-733-3937.

<http://slph.state.nc.us>

\*Not provided by NCSLPH

**North Carolina State Laboratory of Public Health (NCSLPH)  
Packaging & Shipping Instructions for blood lead/prenatal specimens**

<u>Shipping Method</u>	<u>Regulatory Agency</u>	<u>Classification</u>
NC courier system	Dept. of Transportation	Not Subject
US Postal Service	IATA	Exempt Human

**Maximum volume per NCSLPH shipping container: 50 ml**

**Supplies needed:**

NCSLPH Blood Lead/Prenatal shipping container with green NCSLPH shipping label  
Securely sealed and labeled primary container (microtainer)  
Cushioning and absorbent material\*  
Leak-proof secondary container (zip-type baggie) with attached biohazard label\*  
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<http://slph.state.nc.us>

\*Not provided by NCSLPH

# Kudos!

The NCSLPH continues to recognize exemplary employees by awarding the State Lab Employee of the Month. Employees are encouraged to nominate co-workers who demonstrate great work ethics and always lend a helping hand. Our latest recipients were:

<b>January</b>	Mattie Mayes, Administration
<b>February</b>	Roy Cannady, Administration
<b>March</b>	Linda Graham, Cancer Cytology
<b>April</b>	Holly Lee, Laboratory Preparedness-Bioterrorism and Emerging Pathogens
<b>May</b>	Shonna Jones, Virology/Serology
<b>June</b>	Tamara Locke, Administration

Congratulations to all of our winners and thank you for your contributions to the NCSLPH!

The NCSLPH Cytology Department passed ASCP proficiency testing for the third year in a row. Testing is proctored and participants have to receive a 90% to pass. Good job, Cytologists!

Congrats to Lisa Ballance for acquiring Lab Consultant Certification through American Medical Technologists. Most of you know Lisa through her tireless work and endless knowledge as a Lab Improvement Consultant based out of Fayetteville. Very impressive, Lisa!

Another Lab Improvement Consultant, Jennifer Anderson, deserves much praise. She has completed the Certificate in Core Public Health Concepts from UNC-Chapel Hill. She also became an N.C. Certified Training Specialist in April and received the Omicron Sigma award at the NCSCLS conference in March. Way to go, Jennifer!

During the Western District NCPHA meeting, two deserving ladies got recognized. Susan Padgett received the Beth Fletcher Award, which is given to the outstanding laboratory professional of the year. She is a Medical Laboratory Techno-

logist for the Laboratory Preparedness-Bioterrorism and Emerging Pathogens Unit, based in Buncombe County N.C. Also recognized was Susan Clark of Avery County Health Department. She received the Alexander-Sayers Award, which is given to an individual who has contributed substantially to the advancement of public health laboratories in the WNCPHA area. Congratulations to all and thank you for everything that you do!

Each year, our State Lab employees are honored with service awards. In June at our Annual Epidemiology Employee Appreciation Picnic, Dr. Leslie Wolf honored many employees who have served our state ranging from 5 to 35 years! Please join us in thanking all of these employees for their hard work and dedication to the state of North Carolina!

## 5 years

Ann Anderson, Environmental  
William McDowell, Administration  
Diana Scarborough, Newborn Screening

## 10 years

Lisa Hawkins, Laboratory Preparedness-Bioterrorism and Emerging Pathogens  
Marjorie Lavender, Cancer Cytology  
Mattie Mayes, Administration  
Cindy Price, Environmental

## 20 years

Juanita Harris, Virology/Serology  
M. Kristy Osterhout, Lab Improvement

## 30 years

Rick Bordeaux, Environmental

## 35 years

John Neal, Environmental

Please contact Kristy Breedlove at (919) 733-7186 or [kristy.breedlove@ncmail.net](mailto:kristy.breedlove@ncmail.net) if you would like to recognize a co-worker at your facility.



State of North Carolina • Michael F. Easley, Governor  
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